RECORD OF REVISIONS

Rev	Date	Description	POC	RM
0	9/17/2014	Initial issue as Section GEN – General Requirements, Attachment GEN-3, OSHA Requirements for Pressure Systems	Ari Ben Swartz, *ES-EPD*	Larry Goen, *ES-DO*
1	9/22/2023	Revised attachment to REQ-8. Major revisions in the table to provide a better summary of the CFR citations and update the LANL-applied code/standard/etc.	Ari Ben Swartz, *ES-FE*	Dan Tepley, *ES-DO*
2	06/11/2025	Revised reference of NFPA 51A to NFPA 55	Ari Ben Swartz, *ES-OPS*	Michael Richardson, *ES-DO*

Contact the Standards point of contact (POC) for upkeep, interpretation, and variance issues.

Chapter 17	**Pressure Safety POC** (LANL internal)

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1.0 INTRODUCTION

Pressure system design shall meet the requirements of 29 CFR 1910 when the system fluid or type of pressure system listed in the table below applies.

1. A table that summarizes the applicable code requirements of the CFR is below; see CFR for the complete text and all the requirements. *Note: The 29 CFR 1910 text still contains references to very old editions of codes/standards/etc., and the "Summary" column keeps these references as presented in the CFR.*
2. Following the latest applicable edition of the document(s) in the "LANL Applied Code/Standard/etc." column satisfies the OSHA requirement for the systems listed.

29CFR1910 Section	CFR Citation	CFR Reference	Summary of Citation	LANL Applied Code/Standard/etc.
1910 Subpart H – Hazardous Materials				
1910.101 – Compressed gases (general requirements).	1910.101(a)	CGA C-6 (1968) Standards for Visual Inspection of Compressed Gas Cylinders CGA C-8 (1962) Standard for Requalification of ICC-3HT Cylinders	Each employer shall determine that compressed gas cylinders under his control are in a safe condition to the extent that this can be determined by visual inspection.	CGA C-6 CGA C-8
	1910.101(b)	CGA P-1	Required use of CGA P-1 to ensure safe handling, storage, and use of compressed gases.	CGA P-1
	1910.101(c)	CGA S-1.1 (1963 and 1965 Addenda) Safety Release Device —Standards Part 1-Cylinders for Compressed Gases CGA S-1.2 (1963) Safety Relief Standards Part 2-Cargo and Portable Tanks for Compressed Gases	Compressed has containers shall have pressure relief devices installed and maintained in accordance with CGA S-1.1 and S-1.2.	CGA S-1.1 CGA S-1.2
1910.102 - Acetylene.	1910.102(a)	CGA G-1-2003 Acetylene	Acetylene in cylinders shall comply with the provisions of CGA G-1.	CGA G-1
	1910.102(b)	Chapter 9 ("Acetylene Piping") of NFPA 51A-2006 ("Standard for Acetylene Charging Plants") CGA G-1.2-2006, part 3 ("Acetylene piping")	Requirements for acetylene piping systems	NFPA 55 CGA G-1.2
1910.103 - Hydrogen.	1910.103(b)(1)(iii)	Section 2 – "Industrial Gas and Air Piping" – Code for Pressure Piping, ANSI B31.1-1967	Requirements for piping, tubing, and fittings in hydrogen service	ASME B31.3
	1910.103(c)(1)(i)	ASME Boiler and Pressure Vessel Code, Section VIII - Unfired Pressure Vessels (1968) or applicable provisions of API Standard 620, Recommended Rules for Design and Construction of Large, Welded, Low-Pressure Storage Tanks, Second Edition (June 1963) and appendix R (April 1965), DOT Specifications and Regulations	Requirements for the design, construction, and testing of liquefied hydrogen storage containers.	ASME BPVC Section VIII, Division 1 API 620 49 CFR

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	1910.103(c)(1)(iv)(a)(1)	CGA Pamphlet S-1, Part 3, Safety Relief Device Standards for Compressed Gas Storage Containers	Requirements for safety relief devices for stationary liquefied hydrogen systems.	CGA S-1.3
	1910.103(c)(1)(iv)(a)(2)	CGA Pamphlet S-1, Safety Relief Device Standards, Part 1, Compressed Gas Cylinders and Part 2, Cargo and Portable Tank Containers.	Requirements for safety relief devices for portable liquefied hydrogen systems.	CGA S-1.1 CGA S-1.2
	1910.103(c)(1)(iv)(d)	N/A	Safety relief devices shall be provided for piping wherever liquefied hydrogen could be trapped between closures [i.e., liquid lock].	ASME B31.3 or B31.12
	1910.103(c)(1)(v)(b)	Pressure Piping Section 2 - Industrial Gas and Air Piping, ANSI B31.1-1967 with addenda B31.1-1969; Petroleum Refinery Piping ANSI B31.3-1966; Refrigeration Piping ANSI B31.5-1966	Design code requirements for both gaseous hydrogen piping (above -20°F) and liquid or cold gaseous (below -20°F) hydrogen piping.	ASME B31.3 or B31.12
	1910.103(c)(1)(viii)(b)	N/A	Requirements for safety relief devices for liquefied hydrogen vaporizer and associated piping systems.	ASME B31.3 or B31.12
	1910.103(c)(2)(i)(f)	N/A	If liquefied hydrogen is located anywhere *except* Outdoors (See Table H-3) containers shall have the safety relief devices vented unobstructed to the outdoors at a minimum elevation of 25 feet above grade to a safe location as required in paragraph 103(c)(1)(iv)(b).	ASME B31.3 or B31.12
1910.104 - Oxygen.	1910.104(a) 1910.104(b)(1)	N/A	(READ FIRST) The provisions in 1910.104 apply only to bulk oxygen systems, which are defined as "an assembly of equipment, such as oxygen storage containers, pressure regulators, safety devices, vaporizers, manifolds, and interconnecting piping, which has storage capacity of more than 13,000	N/A

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			cubic feet of oxygen, Normal Temperature and Pressure (NTP), connected in service or ready for service, or more than 25,000 cubic feet of oxygen (NTP) including unconnected reserves on hand at the site. The bulk oxygen system terminates at the point where oxygen at service pressure first enters the supply line. The oxygen containers may be stationary or movable, and the oxygen may be stored as gas or liquid."	
	1910.104(b)(4)(ii)	ASME Boiler and Pressure Vessel Code, § VIII, 1968	Requirements for the design, construction, and testing of liquefied oxygen storage containers.	ASME BPVC Section VIII, Division 1
	1910.104(b)(4)(iii)	ASME Boiler and Pressure Vessel Code, § VIII, 1968 DOT Specifications and Regulations	Requirements for the design, construction, and testing of gaseous oxygen storage containers.	ASME BPVC Section VIII, Division 1 49 CFR
	1910.104(b)(5)(ii)	ANSI B31.1-67 and Addenda B31.1 (1969) Code for Pressure Piping	Requirements for piping, tubing, and fittings in oxygen service.	ASME B31.3
	1910.104(b)(6)	CGA S-1, Part 3, Safety Release Device Standards-Compressed Gas Storage Containers ASME Boiler and Pressure Vessel Code, § VIII, 1968 DOT Specifications and Regulations	Requirements for safety relief devices for bulk oxygen storage containers, whether governed by ASME BPVC or DOT.	CGA S-1.3 ASME BPVC Section VIII, Division 1 49 CFR
1910.105 - Nitrous oxide.	1910.105	CGA G-8.1 (1964)	Requirements for the design, installation, maintenance, and operation of nitrous oxide piping systems.	CGA G-8.1
1910.106 - Flammable and combustible liquids.	1910.106(b)(1)(iii)	UL Standards 142, 58, and 80 API 650	Design standard options for atmospheric tanks containing flammable or combustible liquids (atm. is defined as operating pressure between 0 and 0.5 psig).	UL Standards 142, 58, and 80 API 650

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	1910.106(b)(1)(iv)	API 620 ASME Boiler and Pressure Vessel Code, § VIII, 1968	Design standard options for low pressure tanks containing flammable or combustible liquids (low pressure is defined as operating pressure between 0.5 and 15 psig).	API 620 ASME BPVC Section VIII, Division 1
	1910.106(b)(1)(v)	ASME Boiler and Pressure Vessel Code, § VIII, 1968	Design standard requirement for pressure vessels containing flammable or combustible liquids (pressure vessel is defined as operating pressure greater than 15 psig).	ASME BPVC Section VIII, Division 1
	1910.106(c)(1)	ANSI B31 series	Requirements for the design, fabrication, assembly, testing, and inspection of piping systems containing flammable or combustible liquids.	ASME B31.3
1910.107 - Spray finishing using flammable and combustible materials.	1910.107(e)(5)	ASME Boiler and Pressure Vessel Code, § VIII, 1968	Design standard requirements for spraying containers under air pressure for flammable liquids and liquids with a flashpoint greater than 199.4°F (93°C).	ASME BPVC Section VIII, Division 1
1910.110 - Storage and handling of liquefied petroleum gases.	1910.110(b)(10)(iii) (Table H-26), (d)(2) (Table H-31); (e)(3)(i) (Table H-32), (h)(2) (Table H-34)	ASME Boiler and Pressure Vessel Code, § VIII, 1968	Design standard requirements for relief devices (Table H-26), storage containers other than DOT containers (H-31), fuel containers other than DOT containers (H-32), and storage containers for LPG fueling stations (H-34).	ASME BPVC Section VIII, Division 1
	1910.110(b)(11)(i)(b) and (iii)(a)(1)	ASME Boiler and Pressure Vessel Code, § VIII, 1968	Code of record. Indirect fired vaporizers utilizing steam, water, or other heating medium not in the scope of ASME BPVC Section VIII shall have a design pressure not less than 250 psig and need not be permanently marked. Direct gas-fired vaporizers shall be constructed to ASME BPVC.	ASME BPVC

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1910.111 - Storage and handling of anhydrous ammonia.	1910.111(b)(2)(i), (ii), and (iv)	ASME Boiler and Pressure Vessel Code, § VIII, 1968	Requirements for the design, construction, and testing of nonrefrigerated anhydrous ammonia storage containers.	ASME BPVC Section VIII, Division 1
	1910.111(b)(2)(vi)	ASME Boiler and Pressure Vessel Code, § VIII, 1968	Provisions to permit the continued use or reinstallation of nonrefrigerated anhydrous ammonia storage containers constructed prior to 1968.	ASME BPVC Section VIII, Division 1
	1910.111(b)(7)(iii)	ANSI B31.5-66 Addenda B31.5a (1968) Refrigeration Piping,	Requirements for the design, installation, maintenance, and operation of refrigerant piping systems that use anhydrous ammonia as the refrigerant.	ASME B31.5
	1910.111(d)(1)(ii)	API 620, Fourth Ed. [1970] Including Appendix R, Recommended Rules for Design and Construction of Large Welded Low Pressure Storage Tanks	Requirements for the design of containers for the purpose of anhydrous ammonia storage under refrigerated conditions.	API 620
	1910.111(d)(4)(ii)(b)	CGA S-1.3 (1959) Safety Release Device Standards-Compressed Gas Storage Containers	Requirements for safety relief devices for anhydrous ammonia storage under refrigerated conditions when exposed to fire.	CGA S-1.3
1910 Subpart M - Compressed Gas and Compressed Air Equipment				
1910.169 - Air receivers.	1910.169(a)(2)(i) and(ii)	ASME Boiler and Pressure Vessel Code, § VIII, 1968	All air receivers shall be constructed in accordance with ASME BPVC Section VIII. All safety valves used to prevent overpressurization of air receivers shall be constructed, installed, and maintained in accordance with the ASME Boiler and Pressure Vessel Code.	ASME BPVC Section VIII, Division 1
	1910.169(b)(3)(iv)	ASME Boiler and Pressure Vessel Code, § VIII, 1968	All safety valves shall be tested frequently and at regular intervals to	P101-34, Attachment A, Section A-1

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			determine whether they are in good operating condition.	
1910 Subpart O - Machinery and Machine Guarding				
1910.217 - Mechanical power presses.	1910.217(b)(12)	ASME Boiler and Pressure Vessel Code, § VIII, 1968	Design standard requirement for pressure vessels used in conjunction with mechanical power presses.	ASME BPVC Section VIII, Division 1
1910.218 - Forging machines.	1910.218(d)(4) and (e)(1)(iv)	ANSI B31.1-67 and Addenda B31.1 (1969) Code for Pressure Piping,	Requirements for the design, fabrication, assembly, testing, and inspection of piping systems used for power-driven hammers (steam or air) or air-lift gravity hammers (air).	Most applicable ASME B31 code
1910 Subpart Q - Welding, Cutting, and Brazing				
1910.252 - General requirements.	1910.252(d)(1)(v)	API 1104 (1968) Standard for Welding Pipelines and Related Facilities	Construction standards. The welded construction of transmission pipelines shall be conducted in accordance with the Standard for Welding Pipe Lines and Related Facilities, API Std. 1104-1968, which is incorporated by reference as specified in Sec. 1910.6	API 1104
	1910.252(d)(1)(vi)	API 2201 (1963) Welding or Hot Tapping on Equipment Containing Flammables,	The connection, by welding, of branches to pipelines carrying flammable substances shall be performed in accordance with Welding or Hot Tapping on Equipment Containing Flammables, API Std. PSD No. 2201-1963, which is incorporated by reference as specified in Sec. 1910.6.	API 2201
1910.253 - Oxygen-fuel gas welding and	1910.253(d)(1)(i)(A)	ANSI B31.1-67	Requirements for the design, fabrication, assembly, testing, and inspection of oxygen-fuel gas service	ASME B31.3

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cutting.			piping systems.	
	1910.253(d)(4)(ii)	ANSI A13.1-56 Scheme for the Identification of Piping Systems	Requirements for the marking of Oxygen-Fuel Gas piping lines installed above ground.	ASME A13.1
	1910.253(e)(4)(v) and (5)(iii)	CGA 1957 Standard Hose Connection Standard	Requirements for Oxygen-Fuel Gas station outlet termination connections when station outlets are connected directly to a hose.	CGA E-1
	§1910.253(e)(4)(iv) and (6)	CGA 1958 Regulator Connection Standard	Requirements for Oxygen-Fuel Gas station outlet termination connections when station outlets are equipped with a detachable regulator.	CGA V-7
	1910.253(e)(5)(i)	CGA and RMA (Rubber Manufacturer's Association) Specification for Rubber Welding Hose (1958)	Requirements for hoses used for Oxygen-Fuel Gas service.	CGA E-1